CLAIMS

We claim:

1. A conveyor belt for use in a produce transport system, the belt comprising:

a support belt; and

a plurality of cushioned produce holders arranged on the support belt, wherein the cushioned produce holders are suitable for holding produce products in place and in a desired orientation on the belt during operation, and wherein the cushioned produce holders are configured to limit bruising and damage to the produce products placed on the produce holders.

2. The conveyor belt of Claim 1 wherein the support band includes a plurality of openings formed therein.

3. The conveyor belt of Claim 1 wherein the cushioned produce holders comprise cushioned paddles arranged so that produce products placed between the cushioned paddles are held in place as the belt is in use.

4. The conveyor belt of Claim 3 wherein each the cushioned paddles comprise a layer of material arranged in a bowed configuration to provide padding to a produce products placed between the cushioned paddle.

5. The conveyor belt of Claim 3 wherein the cushioned paddles are arranged so that romaine produce products placed between the cushioned paddles are held in place in a desired orientation as the belt is in use.

6. The conveyor belt of Claim 5 wherein the cushioned paddles are arranged so that the romaine produce products placed between the cushioned paddles are held so that cut ends of the romaine produce products are oriented toward sides of the belt.

7. The conveyor belt of Claim 1 wherein the cushioned produce holders include cushioned holding pads arranged on the belt so that produce products placed in the cushioned holding pads are held in place as the belt is in use.

8. The conveyor belt of Claim 7 wherein the cushioned holding pads are arranged so that lettuce produce products placed on the cushioned holding pads are held in place in a desired orientation as the belt is in use.

9. The conveyor belt of Claim 7 wherein the cushioned holding pads comprise cushioned annular holding pads having an annular shape configured so that produce products placed in an open central portion of the annular holding pads are held in place in a desired orientation as the belt is in use.

10. The conveyor belt of Claim 9 wherein the cushioned annular holding pads are suitable for holding an iceberg lettuce product placed in the open central portion of the cushioned pad so that a cut end of the iceberg lettuce product is facing upward from the surface of the belt.

11. A transport system for conveying produce between workstations, the transport system comprising:

a conveyor system including a plurality of cushioned produce holders suitable for holding produce products, wherein the cushioned produce holders are configured hold produce products in place in a desired orientation on the conveyor system as the conveyor system moves the produce products from one workstation to another workstation, and wherein the cushioned produce holders are configured to reduce the amount of damage done to the produce products as they are conveyed on the conveyor system;

a loading station for loading produce products into the cushioned produce holders; and

an unloading station for unloading the produce products from the cushioned produce holders.

12. The transport system of Claim 11 wherein the conveyor system includes a conveyor belt including thereon the plurality of cushioned produce holders, the belt being an endless conveyor belt guided over a roller system and being driven by a drive

element such that produce products placed in the cushioned produce holders can be conveyed from one workstation to another workstation by the conveyor belt.

13. The transport system of Claim 12 wherein the conveyor belts of the conveyor system includes a conveyor belt having a multiplicity of openings formed thereon.

14. The transport system of Claim 12 wherein the conveyor system includes a plurality of conveyor belts, each belt including thereon the plurality of cushioned produce holders, each belt being an endless conveyor belt guided over a roller system and being driven by a drive element such that produce products placed in the cushioned produce holders can be conveyed from one workstation to another workstation using said plurality of conveyor belts.

15. An agricultural harvesting apparatus incorporating the transport system of Claim 11, wherein the loading station for loading the produce products into the cushioned produce holders includes a plurality of coring stations for coring the produce products; and

wherein the transport system includes an application station for applying shelf life extending materials onto cored portions of cored produce products.

16. An agricultural harvesting apparatus incorporating the transport system of Claim 15, wherein the cushioned produce holders of the conveyor system are configured to hold the cored produce products so that the cored portion points upward; and

wherein the application station is arranged so that the shelf life extending materials applied downward onto the cored portions of the cored produce products.

17. An agricultural harvesting apparatus incorporating the transport system of Claim 16, wherein the cushioned produce holders comprise annular holding pads configured to hold the cored produce products so that the cored portion of the produce product points upward.

18. An agricultural harvesting apparatus incorporating the transport system of Claim 16, wherein the produce product comprises lettuce;

wherein the coring station is suitable for coring lettuce to produce cored lettuce;

wherein the cushioned produce holders are configured to hold the cored lettuce so that the cored portion of the lettuce points upward; and

wherein the application station is arranged so that the shelf life extending materials are applied downward onto the cored portions of the lettuce.

19. An agricultural harvesting apparatus as in Claim 15 further including a cleaning station for cleaning the conveyor system and the cushioned produce holders.

20. An agricultural harvesting apparatus as in Claim 19 further including a drying station for drying excess moisture off the produce product after they have been treated in the application station.

21. An agricultural harvesting apparatus as in Claim 15 further including a recycling station for recycling fluids and shelf life extending materials applied at the cleaning station and the application station.

22. An agricultural harvesting apparatus as in Claim 15 wherein the unloading station further includes a packaging station suitable for the unloading of the cored produce product from the cushioned produce holders and packaging the produce product.

23. The agricultural harvesting apparatus of Claim 15, wherein the coring stations comprise coring and topping stations suitable for both coring and topping the produce product so that the produce product has a cored portion and a cut top portion; and

wherein the application station is suitable for applying shelf life extending materials onto cored portions of the produce product and onto the cut top portion of the produce product.

24. An agricultural harvesting apparatus of Claim 23, wherein the cushioned produce holders of the conveyor system are configured to hold the produce products such that produce product lies sideways on the conveyor system and wherein the cored portion of the produce product points toward one side of the system and wherein the cut top of the produce product points toward another side of the conveyor system; and

wherein the application station is arranged so that the shelf life extending materials are applied from said sides of the conveyor system toward the produce product so that the are shelf life extending materials are applied onto cored portion of the produce product from the bottom of the produce product and applied onto the cut top of the produce product from the top of the top of the produce product.

25. The agricultural harvesting apparatus of Claim 24, wherein the cushioned produce holders comprise cushioned paddles arranged in a spaced apart configuration such that produce products placed sideways on the conveyor system between the spaced apart paddles are held on the conveyor system oriented so that the cored portion of the produce product faces toward one side of the conveyor system and so that the cut top of the produce product faces toward another side of the conveyor system.

26. The agricultural harvesting apparatus of Claim 25, wherein the produce product comprises romaine;

wherein the coring an topping station is suitable for coring and topping romaine;

wherein the cushioned paddles are suitable for holding cored and topped romaine so that the cored portion of the romaine faces toward one side of the conveyor system and the cut top of the romaine faces toward another side of the conveyor system; and

wherein the application station is arranged so that the shelf life extending materials are applied sideways onto the cored portion of the romaine and applied sideways onto the cut top portion of the romaine.

27. The agricultural harvesting apparatus of Claim 15, wherein the produce product comprises harvested romaine and wherein the harvested romaine has been topped in the field;

wherein the coring stations core the topped romaine so that the romaine has a cored portion and a cut top portion; and

wherein the application station is suitable for applying shelf life extending materials onto cored portions of the romaine and onto the cut top portion of the romaine

28. An agricultural harvesting apparatus of Claim 27, wherein the cushioned produce holders of the conveyor system are configured to hold the romaine on its side and

wherein the cored portion of the romaine points toward one side of the system and wherein the cut top of the romaine points toward another side of the conveyor system; and

wherein the application station is arranged so that the shelf life extending materials are axially applied onto cored portion of the romaine and axially applied to the cut top of the romaine.

29. A produce harvesting apparatus comprising:

a conveyor system for conveying harvested produce between workstations, the conveyor system comprising a conveyor belt driven over rollers by a drive element and having a plurality of cushioned produce holders suitable for holding produce products in a desired orientation on the belt during operation;

a coring station suitable for accomplishing at least one of: coring the produce and topping the produce;

a loading station wherein the produce is loaded, having the desired orientation, onto the cushioned produce holders of the conveyor system;

an application station for applying shelf life extending materials onto at least one of a cored portion of the produce and a topped portion of the produce;

and

an unloading station for removing the produce from the conveyor belt.

30. The apparatus of Claim 29 wherein the conveyor belt has a plurality of openings formed therein enabling excess moisture to drain off the produce and the belt.

31. The apparatus of Claim 29 wherein the cushioned produce holders of the conveyor belt comprise a plurality of cushioned paddles suitable for holding produce products in a desired orientation on the belt during operation.

32. The apparatus of Claim 31 wherein the produce products comprise romaine.

33. The apparatus of Claim 32 wherein the coring station is suitable for both coring and topping the romaine;

wherein cushioned paddles are configured such that romaine that has been both topped and cored can be placed between the cushioned paddles so that a cored end of the romaine faces one side of the conveyor belt and the topped end of the romaine faces another side of the conveyor belt; and

wherein the application station axially applies the shelf life extending materials from the top of the romaine onto the topped portion of the romaine and axially applies the shelf life extending materials from the bottom of the romaine onto the cored portion of the romaine.

34. The apparatus of Claim 29 wherein the cushioned produce holders of the conveyor belt comprise a plurality of cushioned pads suitable for holding produce products on the conveyor belt so that the cored portion of the produce products face upward; and

wherein the application station is configured such that the shelf life extending material is applied downward onto the upward facing cored portions of the produce product.

35. The apparatus of Claim 34 wherein the produce products comprise lettuce.

36. The apparatus of Claim 35 wherein the cushioned pads comprise annular cushioned pads having a center portion configured so that cored lettuce can be placed in the center portion of the cushioned pads oriented with the cored portion of the lettuce facing upward and wherein the lettuce is held in this orientation until removed.

37. The apparatus of Claim 29 further including a cleaning station for cleaning the conveyor system and the cushioned produce holders.

38. The apparatus of Claim 37 further including a drying station for drying excess moisture off the produce product after they have been treated in the application station.

39. The apparatus of Claim 38 further including a recycling station for recycling fluids and shelf life extending materials applied at the cleaning station and the application station.

40. The apparatus of Claim 29 wherein the unloading station further includes a packaging station suitable for the unloading of the cored produce product from the cushioned produce holders and packaging the produce product.

41. A coring station for removing a core portion of a produce product, the coring station comprising:

a base board, suitable for having placed thereon produce products;

a coring blade shaped for cutting away a core portion of a produce product placed on the base board; and

a blade mount configured so that the coring blade can be adjustably positioned in order to achieve a desired cut on the produce product in order to cut away a core portion of the produce product.

42. The coring station of Claim 41 further including a backing board positioned so that when a core end of a produce product is placed against the backing board a cut made with the coring blade achieves a desired cut on the produce product and cuts away a core portion of the produce product.

43. The coring station of Claim 42

wherein the coring blade includes a knife portion attached to a shaft having a handle and a recoil mechanism;

wherein the blade mount includes a series of openings that lie a progressively greater distances from the backing board;

wherein the shaft passes through one of the series of openings enabling the alignment of the coring blade with the produce product, such alignment enabling the coring blade to achieve a desired cut on the produce product when the coring blade is depressed toward the base board cutting through the produce product to cut away a desired amount of the core portion of the produce product; and

wherein the recoil mechanism is configured to push the coring blade away from the base board once the produce product is cut.

44. The coring station of Claim 42 wherein the coring station enables the coring of harvested romaine having a core portion and an outer leafy portion; and

wherein the coring blade is a U-shaped blade to enable a greater portion of core portion of the romaine to be cut away while leaving a greater portion of the outer leafy portion of the romaine in place on the head of romaine.

45. The coring station of Claim 42 wherein the coring station enables the coring of harvested romaine having a core portion and an outer leafy portion; and

wherein the coring blade is a truncated V-shaped blade to enable a greater portion of core portion of the romaine to be cut away while leaving a greater portion of the outer leafy portion of the romaine in place on the head of romaine.

46. The coring station of Claim 42 wherein the coring station enables the coring of harvested romaine having a core portion and an outer leafy portion; and

wherein the coring blade is a V-shaped blade to enable a greater portion of core portion of the romaine to be cut away while leaving a greater portion of the outer leafy portion of the romaine in place on the head of romaine.

47. A coring and topping station for removing a top portion and bottom core portion of a produce product, the coring station comprising:

a mount positioned such that a produce product can be conveyed through the station; and

a pair of substantially parallel blades positioned in the mount at a predetermined distance from each other so that said blades can cut away a top portion and a bottom portion of a produce product conveyed into the station.

48. A coring blade for using in cutting produce products, the coring blade comprising:

a knife portion attached toward one end of a shaft, the knife portion being configured to cut away an increased proportion of the core portion of the produce product and cut away a decreased portion of the outer portion of the produce product while making a straight cut through the produce product with the coring blade;

a handle attached to another end of the shaft; and

a recoil mechanism mounted with the shaft.

49. The coring blade of Claim 48 wherein the knife portion of the coring blade is U-shaped blade thereby enabling an increased proportion of the core portion of the produce product while cutting away a decreased portion of the outer portion of the produce product while making a straight cut through the produce product with the coring blade.

50. The coring blade of Claim 48 wherein the knife portion of the coring blade is truncated V-shaped blade thereby enabling an increased proportion of the core portion of the produce product while cutting away a decreased portion of the outer portion of the produce product while making a straight cut through the produce product with the coring blade.

51. The coring blade of Claim 48 wherein the knife portion of the coring blade is V-shaped blade thereby enabling an increased proportion of the core portion of the produce product while cutting away a decreased portion of the outer portion of the produce product while making a straight cut through the produce product with the coring blade.

52. A method for harvesting produce comprising:

harvesting lettuce;

performing at least one of coring and topping the lettuce;

loading the lettuce onto the cushioned produce holders of a conveyor system;

holding the lettuce in the cushioned produce holders of the conveyor system;

conveying the lettuce with the conveyor system to an application station;

applying shelf life extending materials onto the lettuce, wherein the shelf life extending materials are applied onto a cored portion and a topped portion of the lettuce;

unloading the lettuce from the cushioned produce holders; and

packaging the lettuce.

53. The method of Claim 52, further including cleaning the conveyor system and the cushioned produce holders.

54. The method of Claim 52, further including drying excess moisture off the lettuce after they have had shelf life extending materials applied.

55. The method of Claim 54, further includes recycling fluids and the shelf life extending materials applied during the applying and cleaning steps.

56. The method of Claim 52,

wherein performing at least one of coring and topping the lettuce comprises coring lettuce to remove a portion of the core from the bottom of the lettuce;

wherein loading comprises loading the lettuce onto the cushioned produce holders of the conveyor system so that a cored bottom of the lettuce faces upward; and

wherein applying the shelf life extending materials comprises applying the shelf life extending materials downward onto the cored bottom of the lettuce.

57. The method of Claim 56, wherein holding the lettuce in the cushioned produce holders of the conveyor system comprises holding the lettuce so that a cored bottom of the lettuce faces upward in an annularly shaped cushioned holding pad.

58. The method of Claim 52,

wherein performing at least one of coring and topping the lettuce comprises coring and topping romaine lettuce to remove a portion of the core from the bottom of the romaine and a portion of the top of the romaine;

wherein loading comprises loading the romaine onto the cushioned produce holders of the conveyor system so that a romaine lies on its side and wherein the cored bottom of the romaine faces toward one side edge of the conveyor system and wherein the top portion of the romaine faces toward another side edge of the conveyor system; and

wherein applying the shelf life extending materials comprises axially applying the shelf life extending materials from the top of the romaine onto the top portion of the romaine and axially applying the shelf life extending materials from the bottom of the romaine onto the cored portion of the romaine.

59. The method of Claim 58, wherein holding the romaine in the cushioned produce holders of the conveyor system comprises holding each head of romaine between two cushioned holding paddles.